DICERANDRA MODESTA (LAMIACEAE): RAISE IN RANK FOR A DISJUNCT PERENNIAL IN A NEW COASTAL CLADE IN FLORIDA Robin B. Huck Florida Museum of Natural History University of Florida

Gainesville, Florida 32611, U.S.A. mints@bellsouth.net

ABSTRACT

Dicerandra frutescens subsp. modesta is raised to species rank: Dicerandra modesta. Recent molecular studies show this new perennial species to be a disjunct aligned with the Dicerandra species of the Atlantic Coastal Ridge of eastern Florida not with Dicerandra frutescens of the Lake Wales Ridge of interior central Florida. Differences in corolla coloration, anther spur ornamentation and pollination ecology distinguish Dicerandra modesta from the members in the new coastal clade.

KEY WORDS: Dicerandra modesta; Lake Wales Ridge; Atlantic Coastal Ridge; southeastern U.S. endemics; pollination

RESUMEN

Dicerandra frutescens subsp. modesta se eleva al rango de especie: Dicerandra modesta. Recientes estudios moleculares muestran que esta nueva especie perenne es disyunta y emparentada con las especies de Dicerandra de la cadena costera del este de Florida y no con Dicerandra frutescens de la cadena de Lake Wales de la parte interior central de Florida. Las diferencias en la coloración de la corola, la ornamentación del espolón de la antera y la ecología de la polinización diferencian Dicerandra modesta de los miembros del nuevo clado costero.

New molecular phylogenetic evidence (Oliveira et al. 2007) necessitates a review of the status of Dicerandra frutescens Shinners subsp. modesta Huck, and, when supported by distinctive morphological and pollination characters, requires a raise in rank to species so that this new taxon can be represented correctly in the upcoming volume of the Lamiaceae for the Flora of North America Project. This designation is in keeping with the concept of species within the group.

Dicerandra modesta (Huck) Huck, comb. et stat. nov. BASIONYM: Dicerandra frutescens Shinners subsp. modesta Huck, Novon 11:417. 2001. TYPE: U.S.A. FLORIDA. Polk Co: Black Road, E of Dundee, sandy ridge, 30 m, 9 Sep 1999, R.B. Huck 5555 (HOLOTYPE: FLAS!; ISOTYPES: MO!, USF!).

An endemic genus of the southeastern United States characterized by spurred anthers, Dicerandra has 4 annual species in D. subgenus Dicerandra and, now, 6 perennial species in D. subgenus Kralia, the latter all rare and found on relict, island-like sandy ridges in Florida (Huck 1987, 1992, 2001, 2007; Huck & Chambers 1997; Huck et al. 1989). With a pale yellow to pinkish-white corolla, a geniculate corolla tube and smooth spurred anthers typical of adaptations to bee fly pollination, Dicerandra modesta was originally recognized as a subspecies of D. frutescens, a taxon with a similar morphology and adaptation (Huck 1987, 2001; see Deyrup & Menges 1997). Further, this previous subspecies was thought to be yet another of the many endemics of the Lake Wales Ridge (Huck et al. 1989; Christman & Judd 1990), the interior ridge of central Florida. However, in the molecular phylogenetic study of Oliveira et al. (2007), both an analysis of ITS data and a combined analysis of ITS and chloroplast data sets showed Dicerandra modesta was surprisingly not allied with D. frutescens, but instead, was included in a well supported coastal clade with coastal species D. thinicola H.A. Mill. and D. immaculata Lakela. Another tree based on chloroplast data supported the distinctness of these perennial species (Oliveira et al. 2007). In contrast to Dicerandra modesta, these two coastal taxa have pale purple to purplish-red to pink corollas, smoothly bent corolla tubes and ornamented "brush" anthers spurs typical of bee pollinator adaptation.

Dicerandra thinicola and D. immaculata (and its variety D. immaculata var. savannarum Huck) grow in isolated sand pine [Pinus clausa (Chapm. ex Engelm.) Vasey ex Sarg.] - oak scrub (Quercus geminata Small;

J. Bot. Res. Inst. Texas 2(2): 1163 – 1164. 2008

Journal of the Botanical Research Institute of Texas 2(2)

Q. myrtifolia Willd.) plant communities near the ocean 60 miles from one another along the 300-mile-long Atlantic Coastal Ridge of Florida, some 60 to 80 miles to the east of the type locality of D. modesta found in a similar habitat on the parallel central ridge. Both Dicerandra modesta and D. thinicola are tetraploids and, at least based on ITS data, are more closely related to each other than to hexaploid D. immaculata (Huck & Chambers 1997; Oliveira et al. 2007).

Dicerandra modesta is a chamaephytic perennial with floral shoots arising from a branched woody base and the inflorescence is a verticillaster with 2–3 flowers to a cyme, blooming successively in an exuberant burst from late August through September. The specific name modesta meaning "shy" is derived from the tendency of the pale yellow-colored corollas to blush to pink when the flowers are in full anthesis. The very slender, geniculate tube of the corolla flares to a trumpet-shape, with the upper lobe an ovate-shaped standard, marked with trellised red-purplish markings and the lower tripartite lobe, separated from the upper lobe by a deep sinus, is marked with spots of the same color. Four stamens are declinate along the lower lobe of the corolla and the anthers have large pollen sacs divided by a glandular, widened connective. Each pollen sac is subtended by a linear, glabrous or a few-haired spur terminating in a forked tip of 3–5 cells. Dicerandra modesta is apparently reproductively isolated from the two coastal species by geography, pollinator preference and, in the case of D. thinicola (which blooms in October and November), a displacement of blooming time. A key to this small genus will be included in the treatment in the Flora of North America Project.

ACKNOWLEDGMENTS

I thank D.L. Black for observations on the pollination of Dicerandra modesta. I thank H.L. Chambers and an anonymous reviewer for their insightful comments and T. Lindler, and especially K. Perkins and N.H. Williams (FLAS) for their continuing generosity and support.

REFERENCES

CHRISTMAN, S.P. AND W.S. JUDD. 1990. Notes on plants endemic to Florida scrub. Florida Sci. 53:52-73.

DEYRUP, M. AND E.S. MENGES. 1997. Pollination ecology of the rare scrub mint Dicerandra frutescens (Lamiaceae). Florida Sci. 60:143–157.

HUCK, R.B. 1987. Systematics and Evolution of Dicerandra (Labiatae). Phanerog. Monogr. 19:1–343. J. Cramer, Gebruder Borntraeger, Berlin, Germany.

HUCK, R.B. 1992. Overview of pollination biology in the Lamiaceae. In: R.M. Harley & T. Reynolds, eds. Advances in Labiate Science. Royal Botanic Gardens, Kew, UK. Pp. 167–181.

Ниск, R.B. 2001. Two new infraspecific taxa in Florida Dicerandra (Labiatae). Novon 11:417-420.

HUCK, R.B. 2007. Clarification of the type locality of Dicerandra linearifolia (Labiatae). Rhodora 109: 387-394. Huck, R.B. AND H.L. CHAMBERS. 1997. Polyploidy: a factor in the evolution of Dicerandra Benth. (Labiatae). Edinburgh

J. Bot. 54:217-229.

HUCK, R.B., W.S. JUDD, W.M. WHITTEN, J.D. SKEAN, JR., R.P. WUNDERLIN, AND K.R. DELANEY. 1989. A new Dicerandra (Labiatae) from the Lake Wales Ridge of Florida with a cladistic analysis and discussion of endemism. Syst. Bot. 14:197-213. Oliveira, L.O., R.B. Huck, M.A. Gitzendanner, W.S. Judd, D.E. Soltis, and P.S. Soltis. 2007. Molecular phylogeny, biogeography, and systematics of Dicerandra (Lamiaceae), a genus endemic to the southeastern United States. Amer. J. Bot. 94:1017-1027.